VENTURA COUNTY AIR POLLUTION CONTROL DISTRICT

RULE 74.19 - GRAPHIC ARTS
(Adopted 8/11/92, Revised 9/10/96, 4/10/2001, 11/11/03)

A. Applicability

The provisions of this rule apply to:

1. Any person who applies any ink, coating, adhesive, fountain solution, or solvent containing Reactive Organic Compounds (ROC) as part of a graphic arts operation.

2. Any person in the District who manufactures any ink, coating, adhesive, fountain solution, or solvent containing VOC sold for use in a graphic arts operation in the District.

B. Requirements

1. Inks, Coatings, and Adhesives: No person shall apply the following inks, coatings, or adhesives with an ROC content in excess of the following limits:

ROC Limits
Grams of ROC per Liter (Pounds of ROC per Gallon) of Coating, Ink, or Adhesive, Less Water and Exempt Organic Compounds

	Effective Dates	
Category	Feb. 28,1993	April 1,2002
Inks	300 (2.5)	300 (2.5)
Flexographic Inks on Porous Substrates	300 (2.5)	225 (1.88)
Coatings	300 (2.5)	300 (2.5)
Adhesives	300 (2.5)	150 (1.25)

For low-solids inks, coatings or adhesives, which have 120 grams per liter (1 pound per gallon) or less of solids, the ROC content is on a grams per liter of material basis.

2. Fountain Solution: No person shall apply fountain solution with an ROC content in excess of the following limits:

Limits
Grams of ROC per Liter (Pounds of ROC per Gallon) of Material

	Effective Dates	
Category	Feb. 28, 1993	April 1,2002
Fountain Solution	115 (0.96)	80 (0.67)
Fountain Solution-Refrigerated	115 (0.96)	100 (0.83)

The l00 g/l (0.83 lb/gal) limit shall only apply to refrigerated fountain solutions that are cooled to 55^{o}F or less at the supply tank. A visible or easily accessible

temperature readout shall be installed, and a sensor shall measure the fountain solution temperature at the supply tank connected to the operating press.

3. Effective until April 1, 2002, no person shall use a solvent to perform cleaning operations unless the solvent ROC composite partial pressure is 33 mm Hg or less at 20^{o}C (68^{o}F) and the solvent ROC content is less than the following limits:

	LIMITS Grams per Liter (g/l) of Solvent (g/l)	LIMITS Pounds per Gallon (lb/gal) of Solvent (lb/gal)
Surface Preparation	450	3.8
Repair and Maintenance Cleaning	750	6.3
Coatings and Adhesives Application Equipment Cleaning	950	7.9
Radiation Curing Ink Removal Cleaning	800	6.7
Ink Application Equipment Cleaning: (including roller wash and blanket wash)		
Lithographic and Letterpress Printing	800	6.7
Other Printing	450	3.8
Other, not listed	200	1.7

Effective April 1, 2002, no person shall use a solvent to perform solvent cleaning unless the solvent complies with the applicable ROC content and ROC Composite Partial Pressure requirements as set forth below:

SOLVENT CLEANING ACTIVITY	LIMITS ROC g/l (lb/gal)		LIMITS ROC Composite Partial Pressure mm Hg @ 20°C
a. Surface Preparation	70 (0.58)		Not Applicable
b. Repair and Maintenance Cleaning	50 (0.42)		Not Applicable
c. Cleaning of Coatings or Adhesives Application Equipment	950 (7.9)	AND	33
d. Cleaning of Ink Application Equipment			
1) General, unless listed below	100 (0.83)	AND	3
2) Flexographic Printing			
a)Specialty Flexographic	810 (6.8)	AND	21
b)Other Flexographic	100 (0.83)	AND	3
3) Gravure Printing			
a)Publication	900 (7.5)	AND	25
b)Packaging	100 (0.83)	AND	3
4) Lithographic or Letter Press Printing			
a)Roller Wash -	300 (2.5)	OR	10
b)Blanket Wash	300 (2.5)	OR	10
c)Metering Roller Cleaner	300 (2.5)	OR	25
d)Plate Cleaner	300 (2.5)	OR	25
5) Radiation Curing Ink	800 (6.7)	AND	33

4. Cleaners Containing Methylene Chloride: Effective April 1, 2002, no person shall use a solvent for cleaning purposes if that cleaner contains any methylene chloride.

5. No person shall perform cleaning operations unless one of the following cleaning devices or methods is used:

    a. Wipe cleaning;

    b. Remote reservoir cold cleaner;

    c. Spray bottles or containers with a maximum capacity of 16 fluid ounces from which solvents are applied without propellant-induced force;

    d. Cleaning equipment utilizing a closable solvent container. The solvent container shall remain closed during cleaning operations, except when depositing and removing objects to be cleaned, and during non-operation, except when performing maintenance and repair to the cleaning equipment.

        1) If a solvent flow method is used, the solvent shall not be atomized.

        2) If a solvent flushing method is used, the solvent shall be flushed through the system by pumping.

6. In lieu of the requirements of Subsection B.1, emissions of ROC, excluding emissions from clean up operations, may be controlled by an emission capture and control system, which reduces ROC emissions to the atmosphere, provided that:

    a. During any period of continuous operation not to exceed 24 hours, the capture and control system shall have a combined efficiency of at least 85 percent, by weight, for publication rotogravure and at least 75 percent, by weight, for other types of printing operations; and,

    b. The collection system shall vent all drying oven exhaust to the control device and shall have one or more inlets for collection of fugitive emissions; and,

    c. ROC emissions are no greater than emissions if compliant inks, coatings, and adhesives as per Subsection B.1 were used; and,

    d. During any period of operation of a thermal incinerator, combustion temperature shall be continuously monitored; and,

    e. During any period of operation of a catalytic incinerator, exhaust gas temperature shall be continuously monitored; and,

f. Written approval for such equipment, in the form of an Authority to Construct and Permit to Operate, is received from the Air Pollution Control Officer (APCO).

7. All ROC-containing materials shall be stored in closed containers that are nonabsorbent and do not leak.

8. ROC material wastes shall be disposed of in a manner consistent with Federal, State, and local hazardous waste regulations.

9. The manufacturer of any ink, coating, adhesive, fountain solution, or solvent subject to this rule shall include the following information on the product container or a data sheet supplied with the product:

a. Material name, manufacturer identification, specific mixing instructions (if applicable).

b. VOC content

1) The VOC content of inks, coatings, and adhesives expressed as grams per liter (or pounds per gallon), less water and less exempt organic compounds. For low-solids inks, coatings or adhesives, the VOC content is expressed as grams per liter of material.

2) The VOC content of fountain solutions and solvents expressed as grams per liter (or pounds per gallon) of material.

c. The VOC composite partial pressure expressed as mm HG at 20^{o}C, if applicable.

d. The density of the material expressed as grams per liter (or pounds per gallon).

e. The solids content of all low-solids inks, coatings or adhesives, expressed as grams per liter (or pounds per gallon).

For the purposes of this Subsection, the term "VOC" is equivalent to the term "ROC".

C. Exemptions

1. The requirements of Subsections B.1, B.2, B.3, and B.4 shall not apply to:

a. Any stationary source that emits less than 200 pounds of ROC in every rolling period of 12 consecutive calendar months from graphic arts

operations. Emissions from aerosol products, cold cleaners, and vapor degreasers shall not be included in this exemption determination. ROC emissions from graphic arts operations used exclusively for research, classroom instruction in schools, laboratory analysis, or determination of product quality and commercial acceptance shall not be included in this exemption determination.

b. Graphic arts operations used exclusively for research, classroom instruction in schools, laboratory analysis, or determination of product quality and commercial acceptance provided total emissions of ROC from such equipment are less than 200 pounds in any rolling period of 12 consecutive calendar months from printing, coating, adhesive, and solvent cleaning operations.

2. The requirements of this rule shall not apply to:

a. Screen Printing, which is subject to Rule 74.19.1.

b. Operations which apply any ROC containing ink, coating, or adhesive on ceramic materials.

c. Circuit Board Printing.

d. Operations using darkroom equipment associated with lithographic printing plate making.

e. Operations which apply inks used to indicate that sterilization has occurred.

f. Ink Jet printing.

D. Recordkeeping Requirements.

Any person subject to this rule shall:

1. Maintain a current file for each ink, coating, and adhesive in use and in storage. The file shall include a data sheet or material list that provides material name, manufacturer identification, applicable product category from Subsection B.1, specific mixing instructions, and grams of ROC per liter (or pound of ROC per gallon) of coating (or ink or adhesive) less water and less exempt organic compounds, and grams of ROC per liter (or pounds of ROC per gallon) of material.

2. Maintain a current file for each fountain solution and cleaning solvent in use and in storage. The file shall include a data sheet or material list that provides

material name, manufacturer identification, applicable solvent cleaning activity from Subsection B.3 for each cleaning solvent, specific mixing instructions if any, grams of ROC per liter (or pounds of ROC per gallon) of material, and, if applicable, ROC composite partial pressure.

3. Maintain records on a daily basis showing the amount of inks, coatings, adhesives, fountain solutions, and solvents used. If only compliant inks, coatings, adhesives, fountain solutions, and solvents are used, these records may be maintained on a monthly basis instead of a daily basis.

4. Any person claiming the exemption in subsections C.1.a. or C.1.b shall provide monthly records sufficient to substantiate this claim, as follows:

    a. Ink emission records shall be maintained using one of the following options and District-approved emission factors:

        1) Group the quantity of all inks used and use the highest ROC content, and the minimum density,

        2) Report process inks and pantone colors separately and:

            a) Use the specific ROC content and density values for each process ink and the highest ROC and the minimum density for pantone inks; or

            b) Use the highest ROC content and minimum density for both process and pantone inks.

        3) Itemize each ink and pantone color and use the specific ROC content and density value for each.

        For the purpose of subsection D.4.a, "minimum density" means the lowest weight per unit volume for inks in a reported group, or the default value of 1.01 kilograms per liter (8.44 pounds per gallon) where minimum density is unknown.

    b. Coating, adhesive, fountain solution, and solvent emission records shall be maintained by itemizing each coating, adhesive, fountain solution, and solvent and using the specific ROC content and density value for each.

5. If compliance is achieved through the use of emission control equipment maintain daily records of key system operating parameters for emission control equipment as specified in the Permit to Operate.

6. The recordkeeping method chosen shall be made a part of the Permit to Operate. If a permit is not required:

a. Records shall be maintained as if only compliant materials were being used; and

b. The recordkeeping method chosen shall be submitted to the APCO for filing; and

c. The record keeping method shall not be changed without written approval of the APCO.

7. Inventory, usage, and emission control equipment operation records shall be retained for a minimum of two years and shall be made available to District Personnel upon request.

E. Test Methods

1. Measurement of the ROC and/or solids content of inks, coatings, adhesives, fountain solutions, and solvents, except publication rotogravure inks shall be conducted and reported in accordance with EPA Reference Method 24 and SCAQMD Method 303 for determination of exempt compounds as necessary.

2. Measurement of the ROC content of publication rotogravure inks shall be conducted and reported in accordance with EPA Reference Method 24A and SCAQMD Method 303 for determination of exempt compounds as necessary.

3. If applicable, measurement of the ROC content of ultraviolet-cured inks shall be determined using ASTM Method D5403-93(1998), Standard Test Methods for Volatile Content of Radiation Curable Materials. This method determines the ROC weight percent of inks designed to be cured by ultraviolet light. Calculation of the ROC content in grams per liter requires knowing the ink density. The density of inks shall be determined using ASTM D1475-98, Standard Test Method for Density of Liquid Coatings, Inks and Related Products.

4. ROC composite pressure shall be calculated using a widely accepted published source such as: Boublik, T., V. Fried and E. Hala, "The Vapor Pressure of Pure Substances," Elsevier Scientific Publishing Co., New York (1973), Perry's Chemical Engineer's Handbook, McGraw-Hill Book Company, CRC Handbook of Chemistry and Physics, Chemical Rubber Publishing Company (1986-87), and Lange's Handbook of Chemistry, John A. Dean, editor, McGraw-Hill Book Company (1985). The true vapor pressure of a component in a solvent mix may be determined by ASTM Method D2879-86. The ROC composite pressure of a solvent mix consisting entirely of ROC may be determined by ASTM Method D2879-86.

5. The capture and control efficiency of air pollution control equipment shall be determined according to EPA's technical document, "Guidelines for Determining

Capture Efficiency," January 9, 1995, and methods in 40 CFR 52.741 (a)(4)(iv), Control Device Efficiency Testing and Monitoring.

6. The ROC content of any cyanoacrylate adhesive shall be determined using SCAQMD Test Method: "Determination of Volatile Organic Compounds (VOC) in Cyanoacrylate Adhesives."

F. Violations

Failure to comply with any provision of this rule, including recordkeeping requirements, shall constitute a violation of this rule.

G. Definitions

1. "Adhesive": Adhesive used in a graphic arts operation such as in the binding or laminating of magazines, books, or other printed materials.

2. "Blanket Wash": Solvent used to clean the rubber-surface fabric used to transfer the image from the plate to the substrate.

3. "Blower": A unit, mounted on a web printing press, that sets and dries nonheatset ink by using unheated ambient air to accelerate the oxidation of the solvent components.

4. "Coating": A layer of material applied to a substrate in a relatively unbroken film.

5. "Exempt Organic Compounds": Shall be as defined in Rule 2 of these rules.

6. "Flexographic Printing": The application of words, designs, or pictures by roll printing technique in which the pattern to be applied is raised above the printing roll and the image carrier is made of rubber or other elastomeric material.

7. "Fountain Solution": The solution applied to the image plate to maintain the hydrophilic properties of the nonimage areas and to keep the nonimage area free from ink.

8. "Fugitive Emissions": Uncollected emissions of VOC from any portion of the printing, coating or laminating operation.

9. "Grams of ROC per Liter of Coating (or Ink or Adhesive), Less Water and Exempt Compounds": The weight of ROC that are emitted during use, coating, curing or drying per combined volume of ROC and coating (or ink or adhesive) solids and can be calculated by the following equation:

Grams of ROC per Liter of Coating (or Ink or Adhesive), Less Water and Less Exempt Compounds = $\frac{W_s - W_w - W_{es}}{V_m - V_w - V_{es}}$

Where: W_s = weight of volatile compounds in grams
W_w = weight of water in grams
W_{es} = weight of exempt compounds in grams
V_m = volume of material in liters
V_w = volume of water in liters
V_{es} = volume of exempt compounds in liters

10. "Grams of ROC per Liter of Material": The weight of ROC per volume of material can be calculated by the following equation:

$$\text{Grams of ROC per liter of material} = \frac{W_s - W_w - W_{es}}{V_m}$$

Where: W_s = Weight of volatile compounds in grams
W_w = Weight of water in grams
W_{es} = Weight of exempt compounds in grams
V_m = Volume of material in liters

11. "Graphic Arts": All screen, gravure, letterpress, flexographic, ink jet, and lithographic printing processes or related coating or laminating processes.

12. "Graphic Arts Operation": Any packaging gravure, publication gravure, flexographic printing, screen printing, letterpress, ink jet, or lithographic printing operation, or any coating or laminating operation manufacturing converted flexible packaging materials for the packaging industry. These operations include printing application equipment, coating equipment, laminating equipment, flash-off areas, ovens, conveyors or other equipment in an uninterrupted series with such operation.

13. "Gravure Printing": An intaglio printing operation in which the ink is transferred from minute etched wells on a plate to the substrate, which is supported by an impression roller, with excess ink removed by a doctor blade.

14. "Heater or Dryer": A device used to vaporize heatset inks.

15. "Heatset Ink": A printing ink used on continuous web-feed printing presses that are equipped with dryers or ovens. The ink dries or sets by heat-induced evaporation of the ink oils and subsequent chilling of the ink by chill rolls.

16. "Ink Jet Printing": Printing methods where the liquid ink is transferred at high velocity through a small diameter opening(s) to a solid substrate. Ink jet systems include, but are not limited to: Air-brush; Thermal-jet; Drop-on-demand using piezoelectric crystals; and Continuous with ink recycling.

17. "Lamination": A process of bonding two or more layers of material to form a single, multiple-layer sheet by using adhesive.

18. "Letterpress Printing": A printing method where the image area is raised relative to the nonimage area and the ink is transferred to the paper directly from the image surface.

19. "Lithographic Printing": Printing by a planographic method in which the image and nonimage areas are on the same plane.

20. "Low-Solids Inks, Coatings or Adhesives": Any product that contains 120 grams or less of solids per liter (1 pound or less of solids per gallon) of material.

21. "Maintenance Cleaning": A solvent cleaning operation or activity carried out to keep general work areas, tools, machinery or equipment excluding application equipment, in clean and good operational condition.

22. "Metering Roller": A roller used to meter the fountain solution to the printing plate in a continuous contacting dampening system on a lithographic printing press.

23. "Nonheatset Ink": Printing ink that sets and dries by absorption into the substrate, and hardens by ambient air oxidation that may be accelerated by the use of infrared, ultraviolet, or electron-beam radiation.

24. "Nonporous Substrate": A substrate whose surface prevents penetration by water, including but not limited to foil, polyethylene, polypropylene, cellophane, metalized polyester, nylon, or mylar. Any paper-like substrate, including cardboard or paperboard, that is coated with a nonporous material shall be considered a nonporous substrate.

25. "Oven": A heating chamber which uses heat, ultraviolet (UV) radiation, or electron beam (EB) radiation to bake, cure, polymerize, or dry a surface coating.

26. "Packaging Gravure": Gravure printing on paper, paperboard, foil, film or other substrates which are to be used to produce containers or packages.

27. "Pantone Color": A printing ink created for color matching by combination of process inks.

28. "Porous Substrate": Any surface or substrate that is permeable to water including but not limited to paper, cardboard, paperboard and any paper product that is coated with a porous material.

29. "Printing Ink": Any fluid or viscous composition used in printing, impressing, or transferring an image onto a substrate.

30. "Process Ink": The hues: yellow, magenta, and cyan, plus black used in the four-color print process.

31. "Publication Gravure": Gravure printing on paper which is subsequently formed into books, magazines, catalogues, brochures, directories, newspaper supplements or other types of printed material.

32. "Radiation Curing Inks": Inks which dry by polymerization reaction induced by either ultraviolet or electron beam radiation.

33. "Remote Reservoir Cold Cleaner": A device in which solvent is pumped through a sink-like work area for cleaning parts and drains immediately, without forming a pool, through a single drain hole less than 100 square centimeters (15.5 square inches) in area into an enclosed container which is not accessible for soaking parts.

34. "Repair Cleaning": A solvent cleaning operation or activity carried out during a repair process. Repair process is the process of returning a damaged object or an object not operating properly to good condition.

35. ROC Composite Partial Pressure": The sum of the partial pressures of the compounds defined as ROCs. ROC composite partial pressure is calculated as follows:

$$PP_c = \frac{\sum_{i=1}^{n} (W_i)(VP_i) / (MW_i)}{(W_w / MW_w) + \sum_{e=1}^{n} (W_e / MW_e) + \sum_{i=1}^{n} (W_i / MW_i)}$$

Where:
W_i = Weight of the "i"th ROC compound, in grams
W_w = Weight of water, in grams
W_e = Weight of the "e"th exempt organic compound, in grams
MW_i = Molecular weight of the "i"th ROC compound, in g/(g-mole)
MW_w = Molecular weight of water, in g/(g-mole)
MW_e = Molecular weight of the "e"th exempt organic compound, in g/(g-mole)
PP_c = ROC composite partial pressure at 20 C, in mm Hg
VP_i = Vapor pressure of "i"th ROC compound at 20C, in mm Hg.

36. "ROC Materials": Inks, coatings, adhesives, materials used for cleanup or of ink, coating, or adhesive removal, solvent, paper and cloth, and waste containing, impregnated with, coated with, or mixed with Reactive Organic Compounds.

37. "Roller Wash": Solvent used to clean the metal ink rollers on a printing press.

38. "Screen Printing": A process where the printing ink passes through a web or a fabric to which a refined form of stencil has been applied. The stencil openings determine the form and dimensions of the imprint.

39. "Solvent Flushing": The use of a solvent to remove uncured adhesives, uncured inks, uncured coatings, or contaminants from the internal surfaces and passages of the equipment by flushing solvent through the equipment.

40. "Specialty Flexographic Printing": Flexographic printing on polyethylene or polypropylene food packaging, fertilizer bags, or liquid-tight food containers.

41. "Sterilization Indicating Inks": Inks that change color to indicate that sterilization has occurred. Such inks are used to monitor the sterilization of medical instruments, autoclave efficiency and the thermal processing of foods for prevention of spoilage.

42. "Surface Preparation": The removal of contaminants such as dust, soil, oil, grease, etc., from a substrate prior to coating, adhesive, or ink applications.

43. "Volatile Organic Compounds (VOC)": Shall have the same meaning as Reactive Organic Compounds (ROC) as defined in Rule 2 of these Rules.

44. "Wipe Cleaning": The method of cleaning a surface by physically rubbing it with a material or device such as a rag, paper, brush or cotton swab moistened with a solvent.